

**Analysis of Findings at the Buckeye Knoll Site (41VT98), Victoria County, Texas  
Quarterly Report No. 3 (through May 28, 2004)**

Prepared by  
Robert A. Ricklis, Ph.D.  
Coastal Environments, Inc.  
525 S. Carancahua Street  
Corpus Christi, Texas 78401

The following analytical procedures were carried out during the past quarterly period:

1. Radiocarbon dating of non-mortuary midden strata. Shown below is a list of 20 calibrated age ranges obtained by Beta Analytic, Inc. on the samples from various arbitrary levels and strata in the two main excavation areas.

Knoll Top Block, assays on faunal bone collagen

Upper Zone 2: 730-670 b.p.  
Upper Zone 2: 1070-950 b.p.  
Middle Zone 2: 1720-1540 b.p.  
Middle Zone 2: 2010-1930 b.p.  
Lower Zone 2: 2740-2540 b.p.  
Lower Zone 2: 2770-2740 b.p.  
Lower Zone 2: 3050-2940 b.p.  
Upper Zone 3: 2320-2150 b.p.  
Upper Zone 3: 4530-4430 b.p.

Knoll Top Block, assays on estuarine shells

Lower Zone 2: 5730-5570 b.p. (*Rangia cuneata*)  
Lower Zone 2: 5740-5570 b.p. (*Rangia cuneata*)  
Lower Zone 2: 5900-5620 b.p. (oyster)  
Lower Zone 2: 7200-6880 b.p. (*Rangia cuneata*)  
Lower Zone 2: 7860-7630 b.p. (*Rangia cuneata*)  
Upper Zone 3: 7560-7360 b.p. (*Rangia cuneata*)  
Upper Zone 3: 8190-7960 b.p. (*Rangia cuneata*)

West Slope Block, assays on faunal bone collagen

Zone 2: 1280-1240 b.p.  
Zone 3: 3980-3860 b.p.

West Slope Block, assays on estuarine shells

Zone 2: 3470-3220 b.p. (oyster)  
Zone 2: 5740-5570 b.p. (*Rangia cuneata*)

Significant observations on these results are:

- A. The dates on faunal bone collagen from the Knoll Top Block Excavation are for the most part in correct sequence sequential order. Additionally, the calibrated ages shown above fit well with the chronological expectations derived from the vertical distributions of time-diagnostic artifacts. Thus, the age range for the upper part of Zone 2, 1070-670 b.p. fits with the fact that Scallorn arrow points overwhelmingly dominate the projectile point assemblage from the relevant levels. Similarly, the age range for the middle part of Zone 2, 2010-1540 b.p., is congruent with the presence of Ensor/Fairland and Godley points found therein. The age range for the lower part of Zone 2, 3050-2540, is in accord with the presence there of Morhiss dart points. In short, it appears that good chronological control is obtained for analyses of materials from the Knoll Top.
- B. The age ranges for faunal bone collagen from the upper part of Zone 3 are clearly too young to be associated with the Paleo-Indian points that were found there. This is interpreted to reflect admixture of materials from the lower part of Zone 2 with upper Zone 3 sediments (along the unconformity that is postulated at the boundary of these two zones). The older of the age ranges for the top of Zone 3, 4530-4420 b.p., probably represents inclusion of faunal materials during the middle Holocene period during which deflation of Zone 3 was taking place. That occupation of the Knoll Top occurred during the middle Holocene is indicated by the presence Bell-Andice and Early Triangular points at the base of Zone 2 and in the upper few centimeters of Zone 3. (The absence of bone dates of ages comparable to the older shell dates can be attributed to decay of bone, which is generally gone from deposits on the Texas coast that are over 4-5,000 years old).
- C. The ages on shell (*Rangia cuneata* and oyster) are much older than those on faunal bone from the same levels and strata. The age discrepancy is 3,000 or more years, far too much to be ascribed to a marine-reservoir or so-called freshwater correction factor. In other words, the shell ages can be reasonably taken at face value, and the age discrepancy is attributed to taphonomic or site-formational factors. Thus, the presence of shell in the bottom of Zone 2 that dates to ca. 5,000 or 7,000 b.p. is inferred to represent deflated, lag-like material that was originally deposited on the top of the Zone 3 sediment prior to, or perhaps during, middle Holocene deflation. The dates on the shells are thus important clues to understanding the processes of site formation and their timing.

Also important to note is that the shell dates almost all fall into previously identified periods of shell-midden formation along the central Texas coast, namely, 8,000-6,800 and b.p., 5,900-4,500 b.p. This is significant in that it suggests that coastal/estuarine biotic resources were sufficiently abundant during these periods to attract human exploitation from residences at some distance inland (as was 41VT98). The fact that rangia clams and oysters were apparently transported directly to the site offers some insight into the nature of human mobility patterns along the coastal prairie during the Early to Middle Archaic.

Finally, the shell dates suggest that people were living at Buckeye Knoll in the seventh millennium b.p., the period to which the Early Archaic cemetery is assigned based on the four radiocarbon assays thus far obtained on human bone collagen. If this was the case, occupational activities were carried out on the knoll top, given that *Rangia cuneata* and oyster shells were recovered there.

So far, the results from the West Slope are inconclusive. Samples have been selected for additional dating, which will be required to gain a reliable resolution on chronology for this important area of stratified midden deposits.

2. Aboriginal ceramics from the site have been sorted and quantified according to types and technological and stylistic attributes. 10X microscopy has been used to identify paste characteristics. Two Late Prehistoric ceramic traditions are represented, namely, the coastal Rockport ware of the coastal zone and the bone-tempered plainware typical of the inland Toyah Horizon. The materials of these two traditions are largely from two different areas of the site.
3. All lithic debitage has been examined for separation of prismatic blades, prismatic blade fragments, and retouched flakes. The removed items have been sorted for metric data recording.
4. Zooarchaeological analysis of faunal bone samples continues. Susan Scott Jackson reports that, as of this time, approximately 15,500 faunal bone elements have been identified according to taxa; 12,500 of these are from the West Slope and 3,000 are from the Knoll Top. While it is too soon in the analysis to make predictions concerning time-dependent trends in faunal resource use, there may be an overall increase in the use of fish through time. Samples are being analyzed according to 2x2-meter excavation units and 10-cm levels. Most samples contain bones of deer, ducks, aquatic turtles, gar, catfish and various finfish. Additional taxa include coati, raccoon, wolf, opossum, numerous snake taxa, bullfrogs, and salamanders. Marine fish species identified include flounder, gafftop catfish, mullet, red drum, croaker, spot, sheepshead and speckled trout.
5. Jason Barrett (Texas A&M University) has concluded a first round of use-wear analysis of 30 flaked-stone tools and has submitted a report with extensive microscopic photography showing various striation and polish wear patterns. Generally, identified wear patterns are congruent with inferred tool functions based on morphology. However, some items identified as drills or perforators were found not to have expectable wear patterns, suggesting that some specimens may have been narrow-bladed, resharpened projectile points.
6. Dr. Noreen Tuross has conducted stable isotope and preliminary DNA testing on seven specimens of human teeth from the cemetery component at the site. Results of these efforts are not yet formally reported (this is expected June 15). However, preliminary assessments of the stable isotope data suggest that various dietary patterns may be represented in the Buckeye Knoll mortuary population, which

may mean that individuals buried at the site had diverse geographic origins. To date, no DNA has been found in any of the samples.

7. Bioarchaeological Analysis of human bone from the mortuary components at the site continues under the direction of Dr. Glen Doran at Florida State University. Primary activities of the last quarter include the following:
  - A. Continued cleaning of burials, specifically removal of soil matrix. There are now only 12 burials which are still being processed for primary matrix removal.
  - B. All cleaned burials have been inventoried with a gross description of the items present and their condition. In this process more subadult dental material has been recovered. Some of this material is associated with known subadults but some appears to represent subadults not previously identified in the field inventory. This step includes basic documentary photography of many of the bone masses with adhering soil matrix and general photographic documentation of matrix removal and bone condition.
  - C. Radiographic documentation of most long bone segments and most cranial material, both intact and disarticulated. Roughly 280 radiographs have been taken.
  - D. Very preliminary counts and analysis of dental material from the cleaned burials. Current inventory has identified 785 adult teeth of which minimally 485 should provide dental metrics. We also have a preliminary inventory of 59 subadult deciduous teeth. Minimally 53 should provide dental metrics. Most of those which may be problematic with respect to standard metrics exhibit extreme wear. However, utilization of tooth dimensions at the cemento-enamel junction will substantially increase data recovery for even very worn teeth. These counts will go up upon completion of matrix removal.
  - E. We have, within the last several days, begun collecting metric and nonmetric data from the cranial and dental material and are modifying several database programs to handle the information.
  - F. During the last five months students in several classes have provided references for additional comparative samples which may be useful in framing the Buckeye Knoll material in a chronological and geographic context.